



## ***Career Cluster Connections Cover Page STEM***

**Career Cluster: STEM**

### **Postsecondary Education Partnerships**

#### **Existing Postsecondary Education Partners:**

##### *In-State:*

- South Dakota State University- Agricultural and Biosystems Engineering (ABE) Major; Civil Engineering (CEE) Major; Electrical Engineering (EE) Major; Electronics Engineering Technology (EET) Major; Engineering Physics Major; Manufacturing Engineering Technology (MNET) Major; Mathematics (MATH) Major; Mechanical Engineering (ME) Major; Software Engineering (SE) Major
- South Dakota School of Mines - Applied Biological Sciences; Applied and Computational Mathematics; Chemical Engineering; Chemistry; Civil Engineering Computer Engineering; Computer Science; Electrical Engineering; Geological Engineering; Industrial Engineering & Engineering Mgmt; Mechanical Engineering; Metallurgical Engineering; Mining Engineering; Physics
- University of South Dakota - Materials Chemistry
- Augustana University - Computer Science and Software Engineering; Dual Degree Engineering; Engineering Physics; Chemical Physics
- University of Sioux Falls - Applied Mathematics for Engineering; Computer Information Systems; Computer Science
- Lake Area Technical Institute- Aviation Maintenance Technology; Electronic Systems Technology; Robotics; Energy Operations; Energy Technology; Environmental Technology
- Mitchell Technical Institute - Electrical Utilities & Substation Technology; Power Line Construction & Maintenance; Utilities Technology – GPS Mapping ;Wind Turbine Technology Electrical Utilities & Substation Technology; Power Line Construction & Maintenance; Utilities Technology – GPS Mapping; Wind Turbine Technology; Automation Controls/SCADA; GPS GIS Mapping Technology; Information Systems Technology; Telecommunications
- Southeast Technical Institute Electrician HVAC/R; Technology Plumbing/Mechanical Systems Technology; Residential Heating & Air Conditioning Technology; Biomedical Equipment Technology; Electronics Technology; Mechatronics Technology; Architectural Engineering Technology; Civil Engineering Technology; Construction Management Technology; Land Surveying Science Technology; Mechanical Engineering Technology
- Western Dakota Tech – Electrical Trades; Environmental Engineering Tech;
- Oglala Lakota College – Pre Engineering; Electrical Technology

##### *Out-of-State:*

- North Dakota State University - Agricultural and Biosystems Engineering; Civil and Environmental Engineering; Coatings and Polymeric Materials; Computer Engineering; Computer Science; Construction Engineering; Construction Management; Electrical Engineering

#### **Potential Postsecondary Education Partners:**

- St. Cloud State

### Dual Credit Opportunities:

CIS		Computer Assisted Design I
CIS	112	Networking Electronics
CIS	125	Advanced Computer Applications
CIS	130	Introduction to Programming
DM	116	Basic Electrical Theory
ET	100	Introductions to Electronic/Mechatronics
MAP	105	GPS Data Collection Mgt
PAT	102	Principles of GPS/GIS
HYS	101	Survey of Physics
BIOL	151L	General Biology I Lab
BIOL	211	Environmental Biology
BIOL	235	Introduction to Biotechnology
BIOL	235L	Intro to Biotechnology Lab
South Dakota Dual Credit Online: <a href="http://doe.sd.gov/octe/dualcredit.aspx">http://doe.sd.gov/octe/dualcredit.aspx</a>		

### Work-Based Learning

#### Career Exploration:

<http://www.avera.org/careers/#health-care-workforce-development>

- Interest Inventories
- Researching careers - SD My Life Activities
- Career camps:
  - <http://sd.gov/careercamps/> -
  - <https://www.sdstate.edu/engr/camps/index.cfm>
  - <http://www.usd.edu/summer-school/summer-camps>
  - <http://www.sdstate.edu/eecs/program-design/index.cfm>
  - <http://www.usd.edu/medicine/healthcare-careers-camp>
  - <http://dsu.edu/events>
  - <http://dsu.edu/events>
  - <http://www.sdsmt.edu/summercamps/>
  - <http://www.mtmc.edu/campinvention/>
  - <http://www.sdstate.edu/isee/stem/index.cfm>
  - [https://twitter.com/SDStateISEE?ref\\_src=twsrc%5Etfw](https://twitter.com/SDStateISEE?ref_src=twsrc%5Etfw)
  - <http://www.bhsu.edu/Community/ClassesCampsandLectures/SummerAcademicCamps/tabid/13898/Default.aspx>
  - <http://www.sdstate.edu/nurs/outreach/health-camp/>

- WISE/MISE other camps, events
- Career Fairs
- Job Shadowing
- Interviews
- South Dakota Innovations Partners
- Industry Internships - examples: Daktronics, 3M, Volga Soybean Processing Plant, Prairie Aquatech (Feed Processing Industry)
- Service Learning
- Guest speakers from business and industry
- Science and Engineering Fair:  
<https://www.sdstate.edu/sciencefair/index.cfm>
- SD Manufacturing Week - first Friday in October is National Manufacturing Day  
<http://www.sdreadytopartner.com/sdmfgweek.aspx>

#### **Intermediate Experiences:**

- Junior/Senior Day
- Career Fairs
- Science and Engineering Fair <https://www.sdstate.edu/sciencefair/index.cfm>
- FFA – Agriscience Fair
- SkillsUSA – Robotics, Engineering Design, Electronics competitions -  
<http://www.skillsusa.org/competitions/skillsusa-championships/contest-descriptions/>
- Technology Students Association - <http://www.tsaweb.org/Competitions>

#### **Capstone Experiences:**

- Research Projects
- Service Learning
- Industry Internships: examples: Daktronics, 3M, Volga Soybean Processing Plant, Prairie Aquatech (Feed Processing Industry)
- Senior Project/Senior Experience
- South Dakota Innovations Partners

#### **Experiential Learning**

Career and Technical Student Organizations and Key Activities (competitions, events, etc.):	Course and CTE Standards Supported:
<ul style="list-style-type: none"> <li>• Skills USA</li> </ul>	Indicator # ITE 3 Solve problems

<p>-<a href="http://www.skillsusa.org/">http://www.skillsusa.org/</a> FFA - Agriscience Competition</p> <ul style="list-style-type: none"> <li>• <a href="#">AISES</a></li> <li>• American Institute of Chemical Engineers (<a href="#">AIChE</a>)</li> <li>• The American Society of Mechanical Engineers (<a href="#">ASME</a>)</li> <li>• The Society of Hispanic Professional Engineers (<a href="#">SHPE</a>)</li> <li>• The Institute of Electrical and Electronics Engineers (<a href="#">IEEE</a>)</li> <li>• Materials Research Society (<a href="#">MRS</a>)</li> <li>• The National Society of Black Engineers (<a href="#">NSBE</a>)</li> <li>• The Society of Women Engineers (<a href="#">SWE</a>)</li> <li>• <a href="#">Science National Honor Society</a></li> <li>• <a href="#">American Chemical Society</a></li> </ul>	<p>using innovation, research, experimentation and design. Indicator # ITE 4 Apply appropriate skill sets to various ranges of technology Indicator # IE 4 Demonstrate effective communication IM1.1 Explore career pathways in manufacturing</p>
<p><b>Service Learning Opportunities/Organizations:</b> Service Learning involves volunteer experiences that directly relate back to the learning in the classroom/content being covered in a course. Examples:</p> <ul style="list-style-type: none"> <li>• Helping with processing/design of data management for events like a track meet</li> <li>• Helping organize a spay and neuter clinic</li> <li>• Organizing a STEM fair with younger students</li> <li>• Organizing a STEM career fair or speakers</li> <li>• Helping with an event like Neutrino Day (leading and activity, helping with logistics)</li> <li>• Assist with ongoing research at a university or government agency</li> <li>• Skills USA</li> </ul>	<p><b>Course and CTE Standards Supported:</b></p> <p>Indicator # ITE 3 Solve problems using innovation, research, experimentation and design. Indicator # ITE 4 Apply appropriate skill sets to various ranges of technology Indicator # IE 4 Demonstrate effective communication IM1.1 Explore career pathways in manufacturing</p>



<ul style="list-style-type: none"> <li>First Lego League: <ul style="list-style-type: none"> <li><a href="http://www.embe.org/Assets/YWCA-SF+Digital+Assets/camps/FLL+Camp+brochure.pdf">://www.embe.org/Assets/YWCA-SF+Digital+Assets/camps/FLL+Camp+brochure.pdf</a></li> </ul> </li> <li>South Dakota 4H Robotics - <a href="http://igrow.org/4h/stem/robotics/">http://igrow.org/4h/stem/robotics/</a></li> </ul>	
<b>Additional Experiential Learning Opportunities:</b> <ul style="list-style-type: none"> <li>BEST Robotics- <a href="https://www.sdstate.edu/engr/camps/best-robotics/">https://www.sdstate.edu/engr/camps/best-robotics/</a></li> <li>Computer Science - <a href="http://www.sdstate.edu/eecs/program-design/index.cfm">http://www.sdstate.edu/eecs/program-design/index.cfm</a></li> </ul>	<b>Course and CTE Standards Supported:</b> <p>Indicator # ITE 3 Solve problems using innovation, research, experimentation and design.</p> <p>Indicator # ITE 4 Apply appropriate skill sets to various ranges of technology</p> <p>Indicator # IE 4 Demonstrate effective communication</p> <p>IM1.1 Explore career pathways in manufacturing</p>

### Certification and Credentials

Certification/Credential	Recommended Prerequisite Courses	Pertinent Details (location of assessment, cost, test prep, etc.)
OSHA 10	Math	<a href="http://www.careersafeonline.com">www.careersafeonline.com</a> \$25.00
AWS - American Welding Society	Tech Ed	
National Career Readiness Certificate	Any Course	<a href="http://dlr.sd.gov/workforce_training/ncrc.aspx">http://dlr.sd.gov/workforce_training/ncrc.aspx</a> This assessment is offered free of charge to school districts.
Project Lead the Way and AP Credential	PLTW Engineering courses and PLTW Computer Science courses	<a href="https://www.pltw.org/ap-project-lead-way">https://www.pltw.org/ap-project-lead-way</a>

**Additional Resources:** Subscribe to the listserve for the SD Technology Educators Association at <https://www.k12.sd.us/MailingList/SDTEA>. South Dakota Society for Technology in Education - <https://sdste.k12.sd.us/> Join the South Dakota Career and Technical Education Association - <http://www.lakeareatech.edu/sdacte/>